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BUILDING AND FENCING MATERIALS:

Prices, margins, and marketing practices

Leland Southard

U.S. Department of Agriculture
Economics, Statistics, and Cooperatives Service

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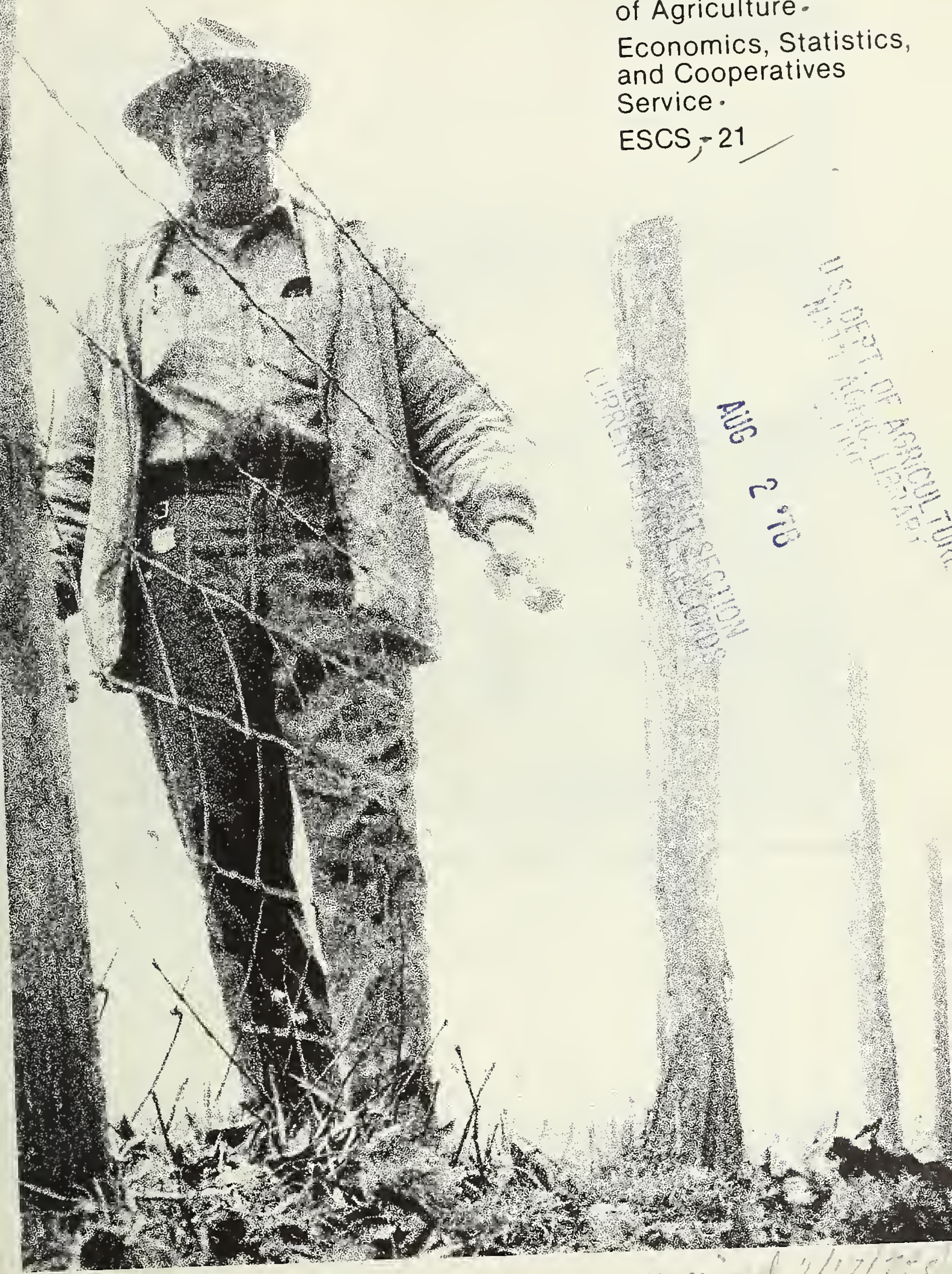

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Farmers spent $5.3 billion for building and fencing materials in 1976. A survey of invoice and retail prices indicates that the product margin (the difference between the two prices) charged by dealers averaged 24 percent of the retail price. The margins of individual items ranged from 20 percent for barbed wire to 32 percent for fence staples and electric cable. Relative margins for building and fencing materials were found to conform reasonably well to demand theory.

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SUMMARY

Prices farmers pay for building and fencing materials increased 89 percent from 1971 to 1977. Expenditures for these materials were $5.3 billion in 1976, almost double those of 1971.

A survey of 240 lumber yards and farm supply stores was conducted in 1976 for 16 building and fencing materials. The margin between dealer invoice and retail prices averaged 24 percent. Individual margins ranged from a low of 20 percent for barbed wire to a high of 32 percent for fencing staples and electric cable.

Margins for individual items varied inversely with relative price elasticity of demand. For example, the price elasticity of demand for nails is relatively inelastic compared with the price elasticity of pine 2x4's. The percentage margin for nails was 32 percent compared to a 22-percent margin for pine 2x4's.

Marketing practices, such as delivery policies and discount practices, varied widely from firm to firm. However, nearly all the firms surveyed indicated they provided 30-day charge accounts for their customers. One-third of the firms indicated they accepted bank charge cards.

Farmers, farm groups, cooperatives, banks, and extension specialists can use the findings of this study to better their understanding of dealers' terms of trade. The information will be useful to manufacturers, wholesalers, and dealers in planning production and marketing. Government and university researchers can use the results of the study in their analyses of farm supply marketing, especially building and fencing items.

BUILDING AND FENCING MATERIALS:
Prices, Margins, and Marketing Practices

Leland Southard 1/

INTRODUCTION

Prices farmers pay for building and fencing materials are rising faster than for all production items (table 1). Building and fencing material prices increased 89 percent from 1971 to 1977, while the prices of all production items increased 77 percent. Farmers spent $5.3 billion for these materials in 1976. This is almost double the expenditure in 1971. Costs for building and fencing materials average about 5 percent of production costs of all farms; however, these materials may account for about 16 percent of total production costs (excluding charges for land) for specialized enterprises such as cow-calf operations.

To better understand these rapidly rising prices and expenditures, information is presented on product margins between dealer invoice prices (including freight) and retail prices for particular items. Information also is presented on the impact of the dealer's marketing services on product margins and prices charged to the farmer for building and fencing materials.

This study will help researchers, business consultants, extension personnel, and others in their analyses and understanding of the factors associated with the higher prices paid by farmers for building and fencing materials.

1/ Southard is an agricultural economist with the National Economic Analysis Division, Economics, Statistics, and Cooperatives Service, U.S. Department of Agriculture.

Table 1--Farm expenditures for building and fencing materials, and indexes of farm production costs, 1971-77

Year	Building and fencing materials		Items of farm origin	Items of nonfarm origin	All production items
	Expenditures	Cost index			
	Million dollars	--------Indexes (1967=100)--------			
1971	2,696	121	114	118	113
1972	2,903	131	126	125	121
1973	3,380	147	174	136	146
1974	4,320	181	176	168	166
1975	4,444	206	169	200	182
1976	5,273	215	179	208	193
1977	NA	229	180	223	200

NA = Not available.

Source: "Farm Production Expenditure Surveys, 1971-1976" for expenditures for building and fencing materials, and Agricultural Prices for indexes; Stat. Rptg. Serv., U.S. Dept. Agr.

Both primary and secondary data will be most useful for these groups to get an overview of farm supply marketing. For market researchers, the variations in pricing policies (discounting and free delivery) are identified and measured as to the extent they are used by building and fencing material dealers. Extension agents will find the information on discounting practices useful in identifying to farmers ways in which their purchases may qualify for discounts.

Farmers and farm groups will benefit from the background information showing relative margins for selected products and product families and the types and amounts of discounts available to farmers. One of the more popular discounts is some form of a quantity discount. Farmers purchasing a large quantity of building and fencing materials may save up to 10 percent of the purchase price, which may be a larger saving than one could make by price shopping the individual items. In addition, by paying cash, the farmer could ask for a discount equal to the dealer's cost of extending credit or accepting a bank charge card.

Firms in the farm supply industry can compare their margins for building and fencing to averages of other firms selling these products. The findings may be helpful in developing pricing and merchandising policies and planning for the future direction of their business.

METHODOLOGY

For this study, product margin is defined as the difference between the retail price farmers pay and the invoice price plus freight charges paid by farm supply dealers. Percentage margin refers to the ratio of the product margin in dollars to the retail price. The margins paid by farmers for each of these 16 items are weighted by quantity to obtain weighted average margins (table 2). To obtain the data needed to study prices, margins, and marketing practices, a survey of building and fencing material dealers was conducted in 1976 in the 25 leading agricultural States. Information was obtained from 177 firms selling building and fencing materials to farmers.

Table 2.--Percentage margins and weights for building and fencing materials

Item	Margin	Weight
	Percent	
Building and fencing materials	24	100
Building materials:	24	86
Shingles	21	3
Insulation board	26	1
Nails	31	4
Electric cable	32	5
Paint	29	3
Roofing	23	36
Pine 2x4	22	8
Pine 2x8	22	8
Fir 2x4	24	9
Fir 2x8	24	9
Fencing materials:	23	14
Barbed wire	20	3
Woven wire	22	2
Wooden post	24	3
Steel post	21	3
Gates	23	1
Staples	32	2

The building and fencing materials were selected from the items included in the index of prices paid by farmers prepared by the Statistical Reporting Service, U.S. Department of Agriculture, and published by that agency in Agricultural Prices. (On January 1, 1978, the Statistical Reporting Service became a part of the Economics, Statistics, and Cooperatives Service.) Considerations given in selecting the items were: (1) the importance of the item in the index, (2) the representativeness of items in relation to particular classes of building and fencing materials, and (3) the likelihood of the item being offered for sale by the respondent firms.

Some items, such as concrete blocks, were not chosen because farmers usually purchase them from local manufacturers. Supply dealers may stock only a few of these items as a convenience to their customers. Many lumber items were omitted because it was felt that pine and fir 2x4's and 2x8's would adequately represent lumber. The 8-penny nail was selected to represent all nails and similar products because of its wide availability.

Other items in the survey included barbed wire, woven wire, wooden posts, steel posts, aluminum gates, paint, roofing, shingles, insulation board, staples, and electric cable (table 2).

Items were handled about the same as in the index of prices paid by farmers, with some changes. Overall weights of the building and fencing components used in the index were modified for this study by switching the weight of rough boards from the fencing component to the building component. This weight was assigned to lumber. Weight which represents all electrical products was assigned to electric cable.

PRICES AND MARGINS

According to the survey data, product margins for the 16 building and fencing materials used for farm production averaged 24 percent in April 1976. Individual margins ranged from 20 to 32 percent of the retail price. Retail and invoice prices and margins for the items are given in table 3.

Building Materials

Margins for building materials averaged 24 percent. These margins ranged from 21 percent for shingles to 32 percent for electric cable. Margins were about the same for lumber and roofing. Insulation board, paint, and nails had margins of 26, 29, and 31 percent, respectively.

Shingles

The survey specifications for shingles were: asphalt, three tabs per shingle, mineral surface, approximately 240 pounds per square. The average retail price per square was $18.93, and the average invoice price was $14.90. The product margin was $4.03, or 21 percent of the retail price.

Table 3--Retail and invoice prices and product margin for building and fencing materials

Item	Retail price	Invoice price	Product margin
	Dollars		
Building materials:			
Shingles	18.93	14.90	4.03
Insulation board	89.09	65.72	23.37
Nails	.42	.29	.13
Electric cable	35.56	24.30	11.26
Paint	8.49	6.00	2.49
Roofing	28.41	22.00	6.41
Pine 2x4	248.97	193.97	55.00
Pine 2x8	258.06	200.03	58.03
Fir 2x4	275.97	209.19	66.78
Fir 2x8	300.63	228.54	72.09
Fencing materials:			
Barbed wire	27.14	21.65	5.49
Woven wire	60.75	47.46	13.29
Wooden post	2.49	1.90	.59
Steel post	2.26	1.79	.47
Gate	50.05	38.68	11.37
Staples	.47	.32	.15

Insulation Board

The survey specifications for insulation board called for 1/2-inch standard asphalt-treated insulation board priced in units of 1,000 square feet. The average retail price paid for insulation board was $89.09, and the average price paid by the dealer was $65.72. The product margin was $23.37 per 1,000 square feet, or 26 percent.

Nails

The survey specifications called for the price per pound of common 8-penny nails, which represents all nails and similar products. The average price paid per pound was $.42, and the average invoice price was $.29. The product margin was $.13, or 31 percent of the retail price. This item had the second largest percentage margin of the building materials.

Electric Cable

The specifications for electric cable were 12-2 Romex with ground wire (copper wire). Electric cable represents all electrical products. The original specification called for the price of 100 linear feet, but was changed to a 250-linear foot roll when most of the respondents reported it that way. The average retail price was $35.56, and the average invoice price was $24.30. The product margin was $11.26, or 32 percent of the retail price.

Paint

Paint was the simplest product in the survey as far as specifications were concerned. Because of the many variations of paints on the market, it was decided not to write a strict specification for paint. The specification was as follows: paint for farm fences and buildings. Respondents were asked to give retail and invoice prices for paint most commonly sold by them for the above purpose. The average retail price was $8.49 per gallon, and the average invoice price was $6. The product margin was $2.49, or 29 percent of the retail price.

Roofing

Metal roofing prices were for squares (100 square feet) of galvanized steel, 28 to 29 gage. In the survey, it was found that the average retail price per square was $28.41, and the average invoice price was $22 per square. The product margin was $6.41, or 23 percent of the retail price.

Lumber

Prices were collected for four lumber items. The general specifications were framing or stud, standard and better, kiln dried. The specifications were further broken into pine and fir. For each species, 2x4's and 2x8's were priced. Pricing only 2x4's was considered, but it was decided that specials on 2x4's might bias the retail prices and margins downward. Thus, both 2x4's and 2x8's were priced at the wholesale and retail level.

Average retail prices per 1,000 board feet were $248.97, $258.06, $275.97, and $300.63 for pine 2x4's, pine 2x8's, fir 2x4's, and fir 2x8's, respectively. Corresponding average invoice prices, including freight per 1,000 board feet, were $193.97, $200.03, $209.19, and $228.54. The product margins were $55, $58.03, $66.78, and $72.09 respectively. The percentage margins, in the same order, were 22, 22, 24, and 24 percent.

Fencing Materials

Margins for fencing materials averaged 23 percent. The margins for fencing material items ranged from 20 percent for barbed wire to 32 percent for staples. Margins for wood posts, steel posts, gates, and woven stock wire were close together, ranging from 21 to 24 percent.

Barbed Wire

The specification in the questionnaire called for galvanized 12-1/2 gage carbon steel, 4-point barbed wire. The average retail price was $27.14 per 80-rod spool, and the average invoice price was $21.65. The product margin was $5.49 per spool, or 20 percent of the retail price.

Woven Wire

Specifications for woven wire were 6-inch stay wire spacing, 12-1/2 gage, and 32 to 50 inches high. Because of the regional difference in height of woven wire sold, respondents were presented with a range of heights rather than a particular one. The respondents were asked to give the retail and invoice prices of the most commonly sold woven wire within the specifications given.

Forty-five percent of the dealers reported wire 32 to 37 inches high as the most commonly sold. Slightly over one-fourth of the respondents gave prices for wire 38 to 43 inches high, while the remaining 29 percent gave prices for wire 44 to 50 inches high. The average retail price per 20-rod spool was $60.75, and the average invoice price was $47.46. The product margin was $13.29, or 22 percent of the retail price.

Wooden Post

The survey specification called for the pricing of treated, wooden line post approximately 4 inches in diameter. Nearly half of the respondents priced posts 5.5 to 6.5 feet in length. About one-third of respondents reported prices for posts 6.6 to 7.5 feet in length. The remaining respondents priced posts over 7.6 feet in length. The average retail price of a wooden post was $2.49, and the average invoice price was $1.90. The product margin was $.59, or 24 percent of the retail price.

Steel Post

The specifications for steel post were: line fence, heavy duty, and 6 to 7 feet in length. The respondents were asked to specify the length of steel post for which they reported prices. Nearly all of the dealers (95 percent) priced steel posts 6 to 6.5 feet in length. The average retail price was $2.26, and the average invoice price was $1.79. The product margin was $.47, or 21 percent of the retail price.

Gates

The gate prices in the survey were for aluminum panel farm gates, 14 to 16 feet in length. Of the respondents reporting prices, 56 percent did so for aluminum gates 14 feet in length, while 44 percent gave prices for gates 16 feet in length. The average price paid for gates was $50.05, and the average invoice price was $38.68. The product margin was $11.37, or 23 percent of the retail price.

Staples

The survey specifications for fence staples were 9 gage, 1-1/2 inch long. The average retail price per pound was $.47, and the average invoice price was $.32. The product margin was $.15, or 32 percent of the retail price. Staples had the largest percentage margin of the fencing material items in the survey.

Product Margins and Demand Elasticities

Buyers are more responsive to prices for certain items than for others. This responsiveness is referred to as the price elasticity of demand. Buyers will increase expenditures for an item as the price declines if the demand is elastic, meaning that the quantity bought will increase by a greater percentage than the decline in price. However, buyers will decrease total expenditures for an item with a decrease in its price if the price elasticity of demand is inelastic, meaning that the quantity bought will increase by a lesser percentage than the decline in price. Thus, sellers stand to gain more revenue from assigning larger margins to items that have an inelastic demand than to those products that have an elastic demand.

The price elasticity of demand is largely determined by: (1) availability of substitutes, (2) expenditures on the item, and (3) length of adjustment time. The more other products that can be substituted for a particular product, the greater its price elasticity of demand will be. If the price of the product increases and the buyer can buy a lower cost substitute, he usually will do so.

In this study, there were five pairs of items that are substitutes. The pairs are: (1) wood and steel posts, (2) barbed and woven wire, to a limited degree, (3) shingles and roofing, (4) pine and fir 2x4's, and (5) pine and fir 2x8's. The margins for these substitutable items ranged from 20 to 24 percent, while the margins of the other items (except aluminum gates) ranged from 26 to 32 percent. Although margins for galvanized and wooden gates were not collected, the relatively low margin for aluminum gates apparently reflects the availability of the other types.

The smaller number of substitutes for a product, the smaller its price elasticity of demand will be. Thus, a product with only a few substitutes would have a smaller price elasticity of demand than a product with many substitutes. Products like nails and staples have relatively few substitutes. Their margins were among the highest for the items studied: 31 and 32 percent, respectively. Thus, the observed margins are in agreement with demand theory.

In general, the larger the percentage of expenditures spent on a product, the greater its price elasticity of demand. Thus, the price elasticity of demand for roofing and lumber, which are large expense items, would likely be greater than the price elasticity for fence staples. Based on the observed margins, this relationship held in this study.

The longer the time period allowed for adjustments in the quantity of a product demanded, the greater its price elasticity of demand. The buyer, if confronted with a sudden price change, may have to buy the product, because he has no other choice. However, over a period of time, he will switch to a lower cost alternative, if at all possible. This study measured margins only at one point in time and, therefore, cannot be used in support of this principle.

BUSINESS SIZE AND MARKETING PRACTICES

The modal sales size of the firms surveyed was $250,000 to $499,999 (table 4). Nearly one-fourth of the firms reported annual sales of $100,000 to $249,999. About one-eighth of the firms had annual sales of less than $100,000. Only 4 percent of the firms had annual sales over $3 million.

Table 4--Number of firms by sales size

Sales Group	Number of firms	Percentage of total firms
0 - $99,999	21	12
$100,000 - $249,999	42	24
$250,000 - $499,999	46	26
$500,000 - $999,999	24	14
$1,000,000 - $2,999,999	36	20
$3,000,000 and over	8	4
Total	177	100

Credit Practices

The respondents were asked two questions about charge privileges made available to their customers. One-third of the respondents indicated they accepted bank charge cards. Practically all of the respondents (96 percent) indicated they provided 30-day charge accounts (excluding bank charge cards) for their customers. No data were collected on the cost of 30-day charges provided by building and fencing material dealers.

Table 5--Delivery policies of building and fencing material dealers who provided free delivery

Qualifying conditions	Distance in miles								
	0 to 10	11 to 20	21 to 30	Over 30	No maximum	No set policy	Trade area only	Not specified	Total
	Number								
Sales:									
0-$99	6	7	7	2	1	0	3	1	27
$100-$199	4	11	3	1	3	0	0	2	24
$200-$299	1	3	0	1	1	0	0	0	6
$300 and over	0	4	0	2	0	0	0	0	6
No minimum	3	5	2	4	10	1	7	1	33
No set policy	0	1	2	0	15	0	0	0	18
Large purchases	1	0	0	4	1	1	0	0	7
Not specified	2	0	0	0	0	0	0	2	4
Total	17	31	14	14	31	2	10	6	125

Table 6--Minimum purchase and discount rate of building and fencing material dealers who discounted to farmers

Type of purchase	Discount rate					
	1 to 5 percent	6 to 10 percent	Over 10 percent	No set policy or flexible	No answer given	Total
			Number			
0 - $499	1	6	0	1	2	10
$500 - $699	4	5	0	0	3	12
$700 and over	3	4	1	1	1	10
Cumulative	1	0	1	0	0	2
No answer given	0	1	0	0	2	3
No set policy	0	1	0	9	0	10
Quantity or major items	2	11	0	0	4	17
Cash	3	1	0	0	2	6
Total	14	29	2	11	14	70

Marketing Services

Delivery policies of dealers providing free delivery exhibited a wide variation in both the maximum distance and the minimum value of materials firms would deliver. About 71 percent (125 out of 177) of the dealers interviewed indicated they did provide some type of free delivery service (table 5).

One-third of the dealers providing the service indicated there was no minimum purchase necessary for the service. About one-half (63) of the dealers providing free delivery services were willing to state a minimum dollar amount of sales necessary for free delivery, and 51 dealers indicated a minimum purchase under $200.

About 61 percent (76) of dealers were willing to indicate a maximum distance in which they would provide free delivery service. Most of these dealers (62) indicated a distance under 30 miles. One-fourth of the dealers indicated they did not have a maximum distance policy.

Many dealers indicated they did not have a specified policy on free delivery. Because of the various delivery policies, it was not possible to generalize about the effect of free delivery on margins.

Discount Policies

About two-fifths of the building and fencing material dealers discounted to customers other than licensed contractors (table 6). The dealers were asked to provide the discount rate and the minimum amount of purchase to qualify for this discount.

About 65 percent of the dealers who discount specified a rate. Most of the specified discount rates ranged from 6 to 10 percent. One-seventh of the dealers said they had no set policy for discounts. Almost one-fourth of the dealers claimed they would discount qualifying purchases for major items and quantity purchases. Six discounted for cash sales. One firm gave discounts to all farmers and ranchers.

Competition and Promotional Considerations

Competition among stores in a market area does not always allow retailers to set margins as high as they might otherwise charge. Margins may be influenced by promotional considerations, such as special prices, coupon sales, and other similar competitive practices. In this one-time survey, it was not possible to measure the effect of such competitive practices on retail margins. However, in the counties studied, there appeared to be enough dealers to provide competition.

APPENDIX--Survey Design

Two separate lists of supply outlets, including cooperatives, were developed for the counties selected to ensure coverage of firms that sold items of interest in the survey. One list was compiled from State directories of retail lumber dealers, and the other was developed from telephone directories and current State statistical offices' lists of farm supply outlets. The final sample consisted of 240 firms, one-half of them retail lumber dealers and the other half farm supply outlets.

The 1972 farm production expenditure survey indicated that when farmers were asked where they purchased building materials, 82 percent listed retail lumber dealers and 11 percent listed cooperatives. When asked where they obtained fencing materials, they listed retail farm supply stores, cooperatives, and retail lumber dealers. For this reason, half of the sample was drawn from the list of retail lumber outlets and half from the list of farm supply establishments.

To reduce survey costs, the study was limited to 25 States which together accounted for 78 percent of the total farm expenses for building, fencing, and irrigation repair expenses in the United States in 1970. The number of respondents and counties per State was allocated on the basis of individual States' share of the 25-State expenditure total. Counties with high production expenses were identified within each State. A total of 120 counties were randomly selected. Two firms, one each from the lumber and supply dealer lists, were randomly selected for each county.

Appendix table 1--Upkeep expenditures for farm buildings, fences, and irrigation systems, leading agricultural States and United States, 1970

State	Expenditures	Counties selected
	1,000 dollars	Number
Texas	140,153	20
California	67,352	10
Iowa	45,786	7
Wisconsin	45,370	7
Minnesota	39,557	6
Illinois	36,713	5
Nebraska	33,342	5
Missouri	31,734	5
Kansas	31,075	5
New York	30,319	4
Pennsylvania	30,153	4
Ohio	28,190	4
South Dakota	24,209	4
North Carolina	23,547	3
Indiana	23,137	3
Oklahoma	22,814	3
Kentucky	22,087	3
Florida	21,390	3
Georgia	20,534	3
Arkansas	19,969	3
North Dakota	18,663	3
Alabama	17,163	3
Mississippi	16,917	3
Tennessee	16,887	2
Michigan	16,729	2
Total 25 States	785,157	120
U.S. Total	1,002,998	

Source: Survey of Agricultural Finance-1970, part II, vol V, table 60, Bur. Census, U.S. Dept. of Commerce. (This is the latest source available for such data on a State-by-State basis.)

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